

The SAHARAN toolbox: A comprehensive assessment of school-age children's growth, cognitive and physical function

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Overview



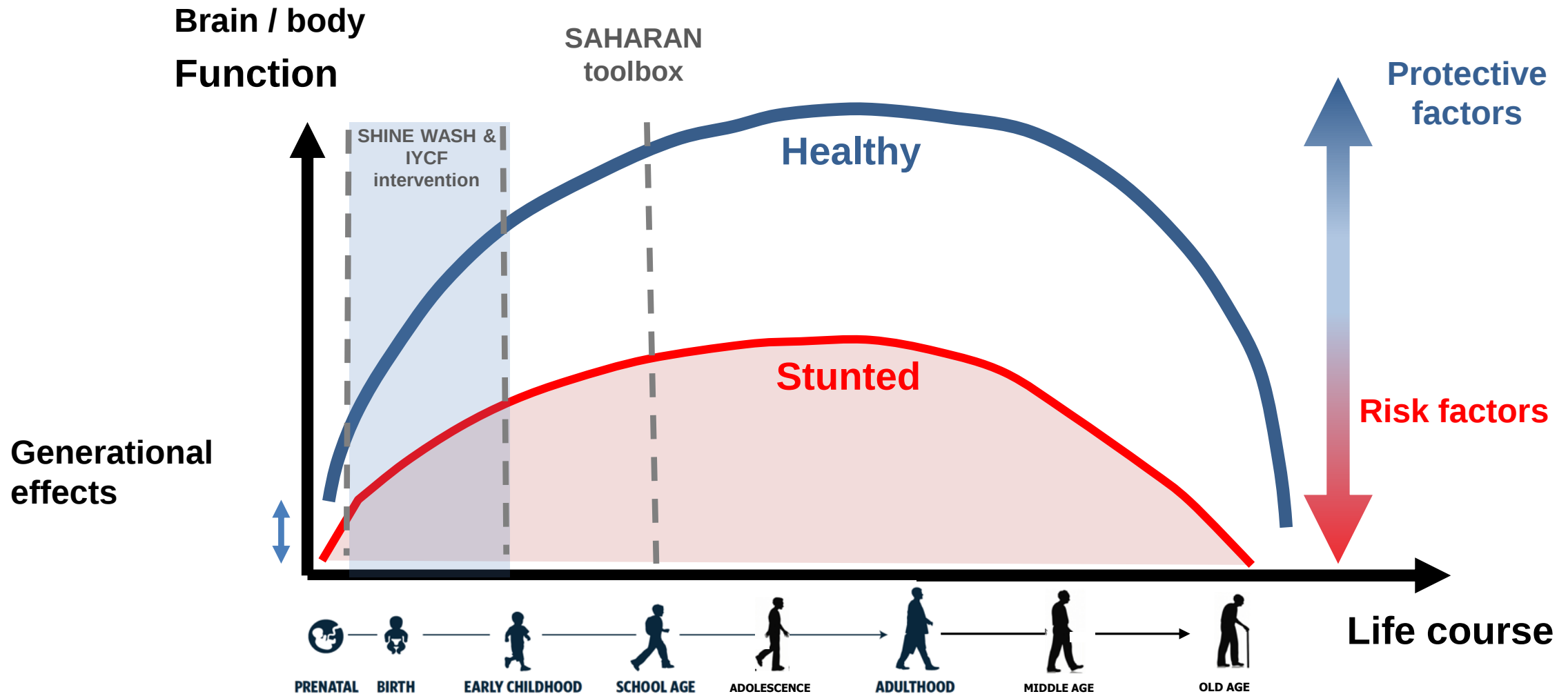
Introduction: Life course, SHINE trial

Methods: SAHARAN toolbox

Results: Growth, physical & cognitive function

Future plans: IMMANA metrics

The Life Course Approach: 250 million children 'failing to thrive'



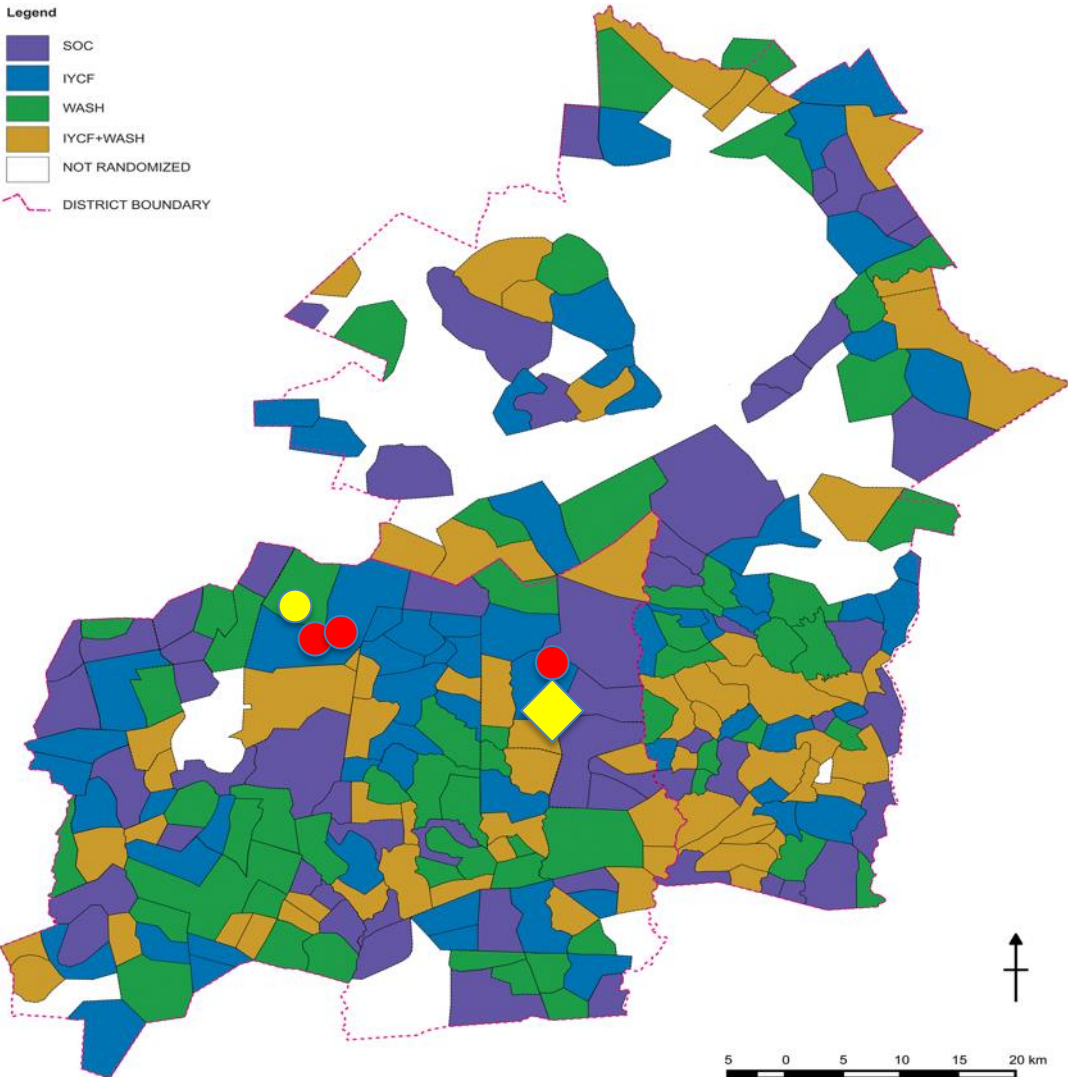
Child Health for All, 6th Ed, Saloonje, Piper et al.

Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants, NCD Risk Factor Collaboration, Lancet Nov 2020

Preliminary data: please do not share

SHINE: independent and combined effects of IYCF and WASH in Zimbabwe

15% children born to HIV-positive mothers “HIV-exposed uninfected” (CHEU)



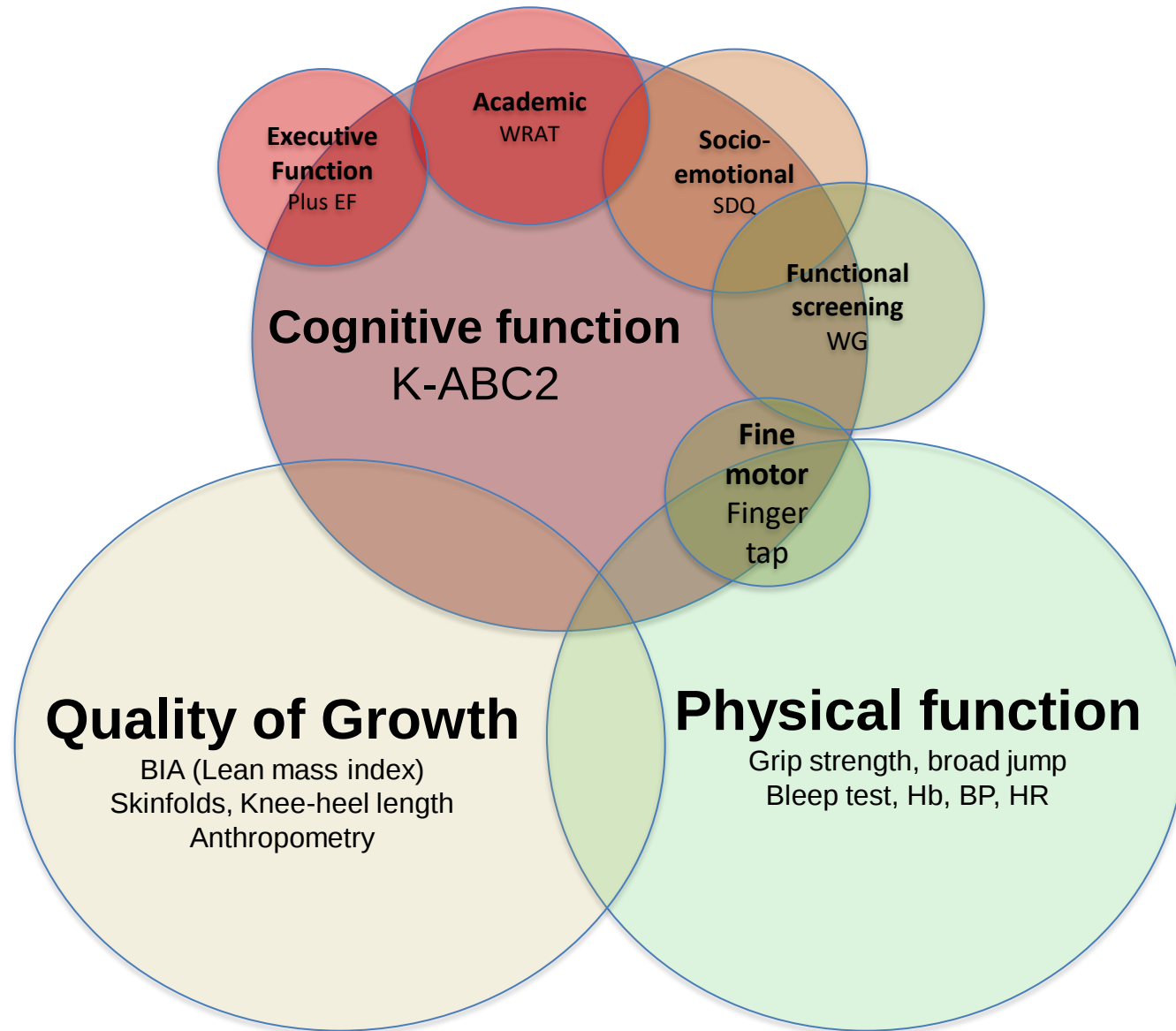
4 to 6+ visits / day [620 visits]

1000 HIV unexposed (CHUU) = 250 in each arm
→ detect a difference of 0.2 SD for the intervention

300 CHEU

→ Detect a difference of 0.2 SD c.f. CHUU (0.35 SD for intervention on CHEU)

3. SAHARAN Development: The school-aged health, activity, resilience, anthropometry and neurocognitive assessment toolbox



Caregiver Questionnaire

- Demographics
- SES
- Child adversity
- CPRS (nurture)
- EPDS (maternal depression)
- Food insecurity (HFIAS, HDDS & H-FOOD)
- Water insecurity (H-WISE, H-WATER, access)
- MICS Child discipline
- Gender norms & social support
- HIV counselling & testing

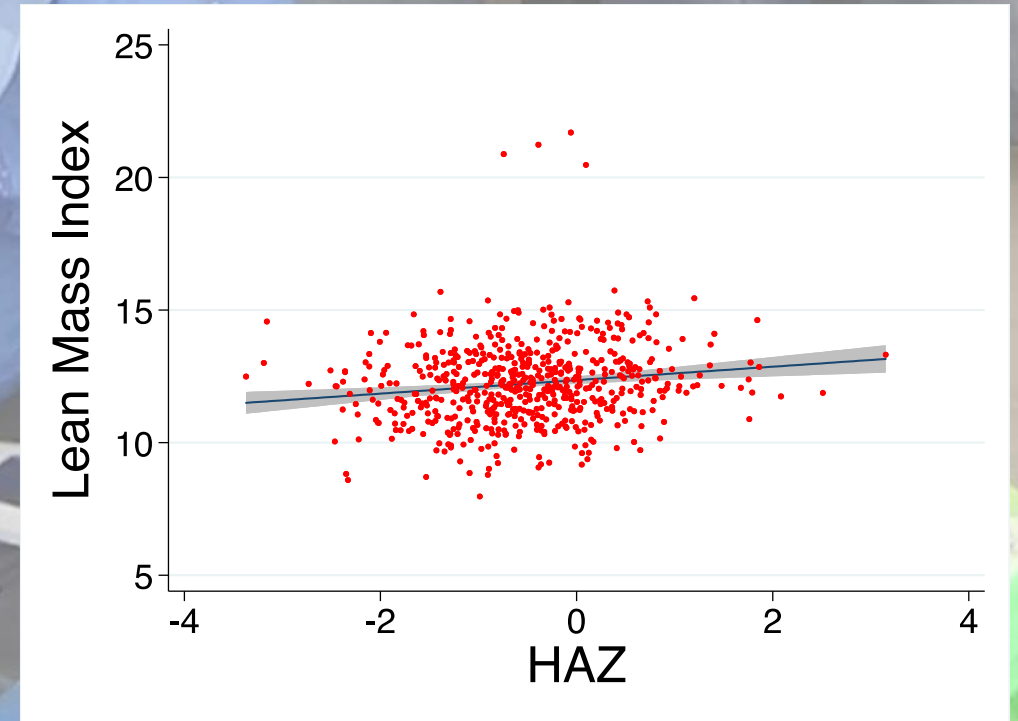


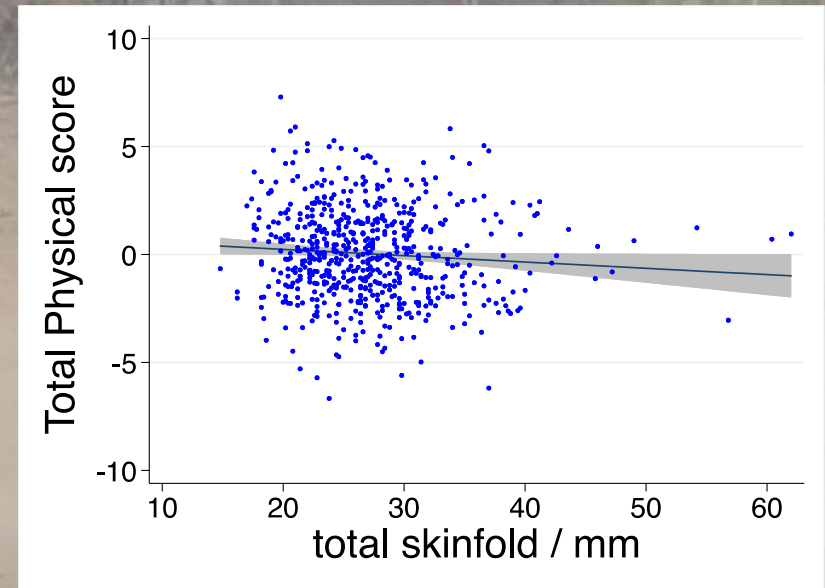
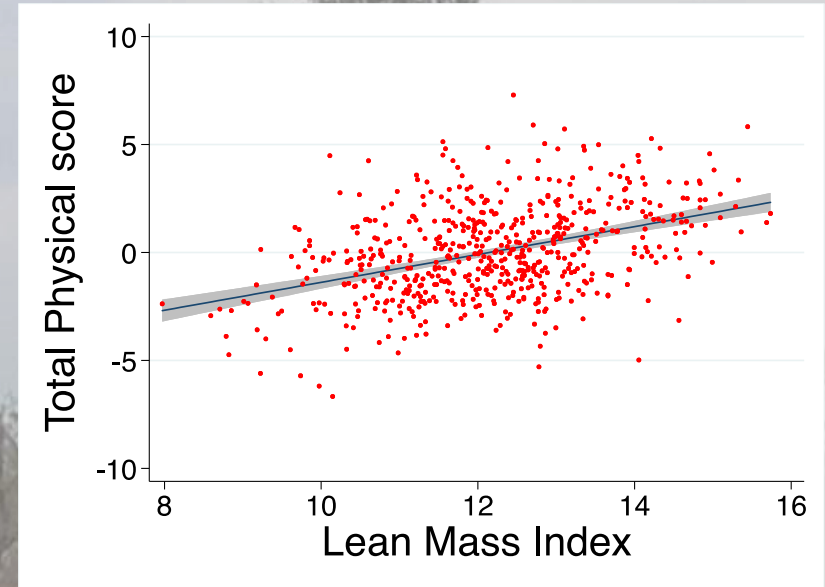
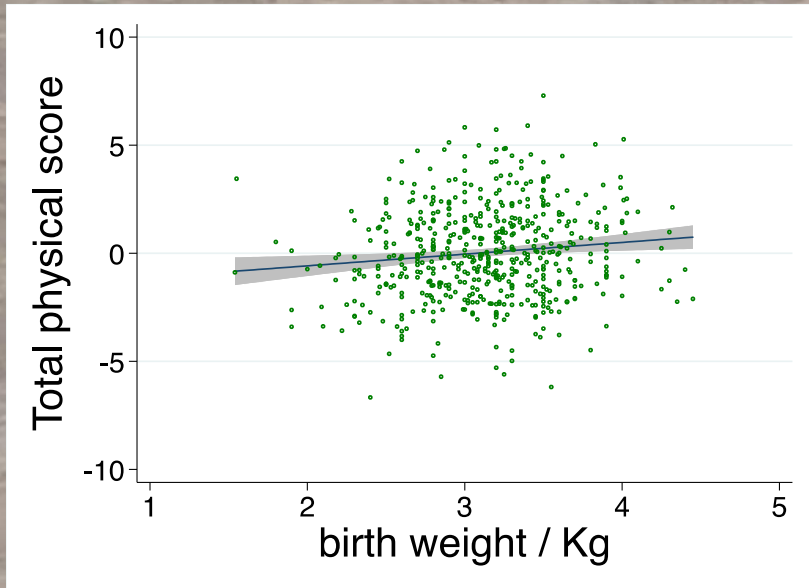
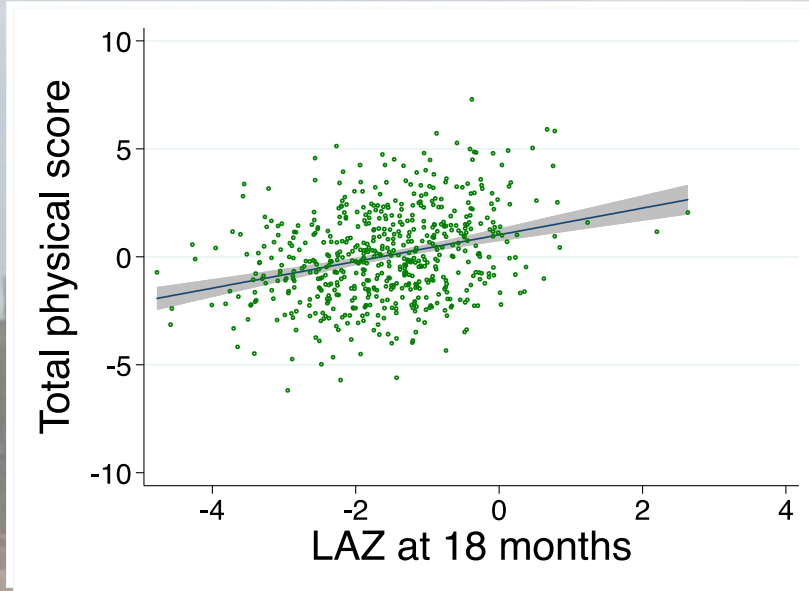
Body composition: Bioimpedance analysis (BIA)

321 girls, 298 boys
Age 7 years,
160 CHEU

Quality of Growth

BIA (Lean mass index)
Skinfolds, Knee-heel length
Anthropometry

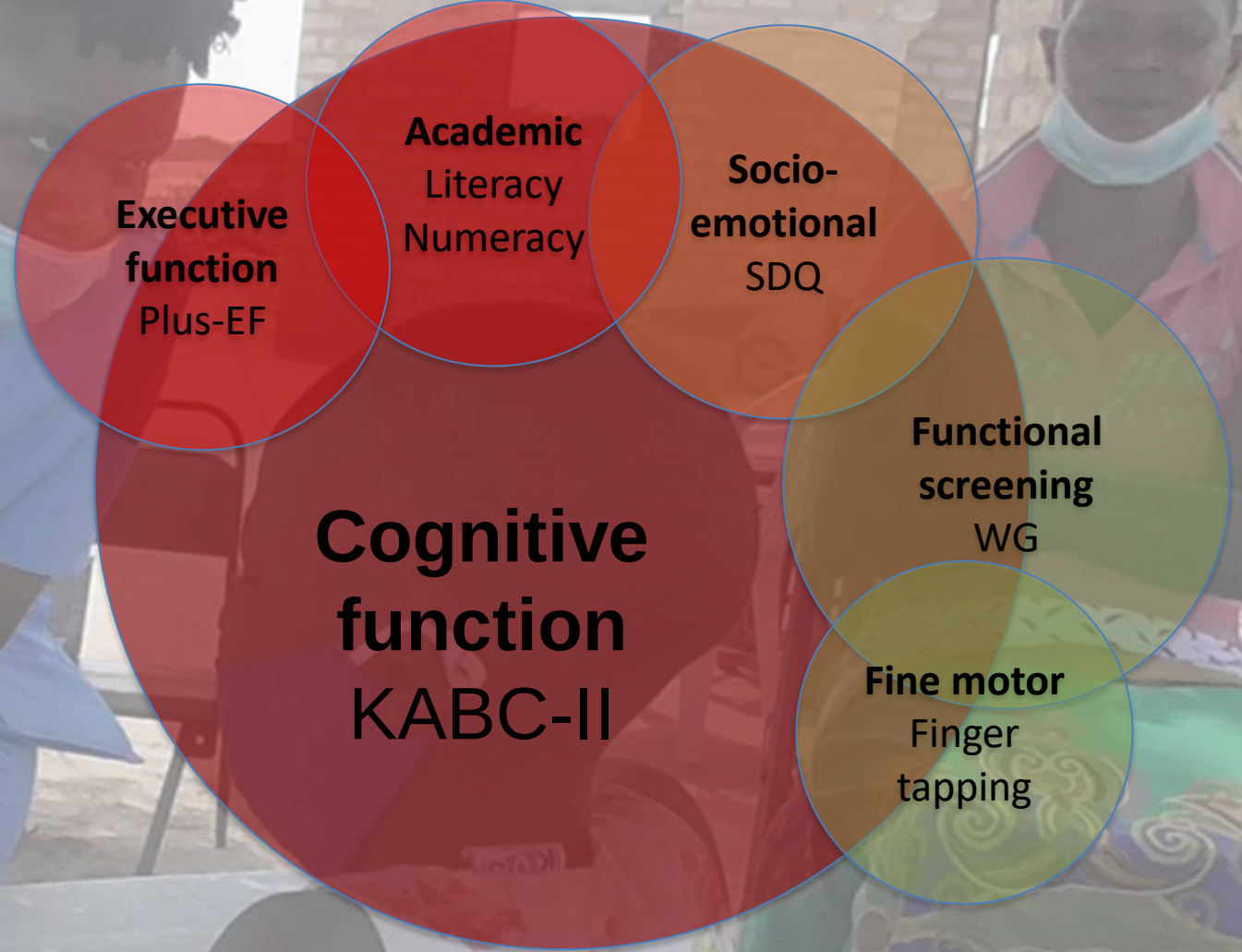




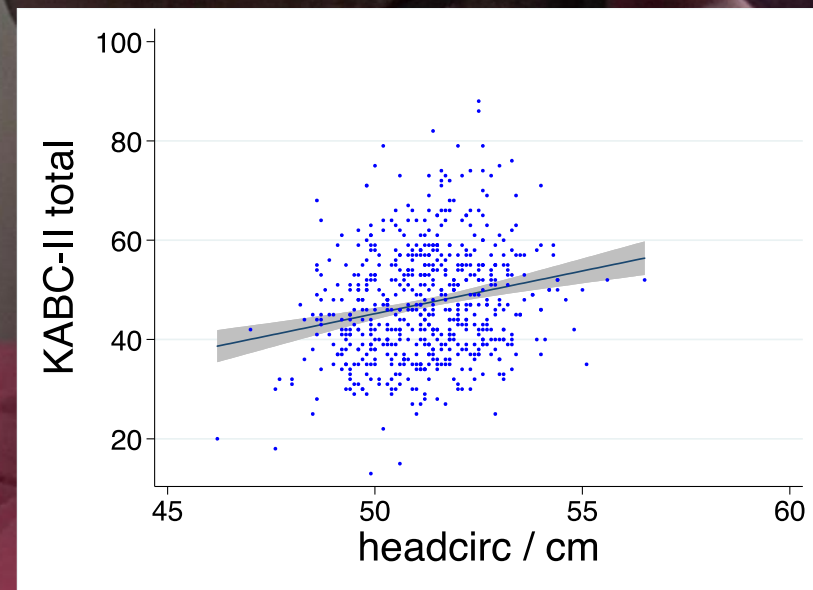
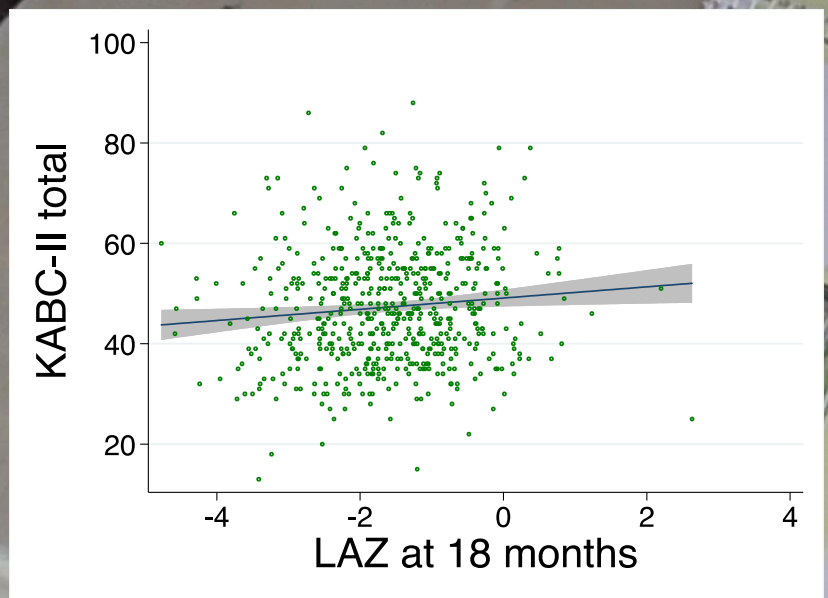
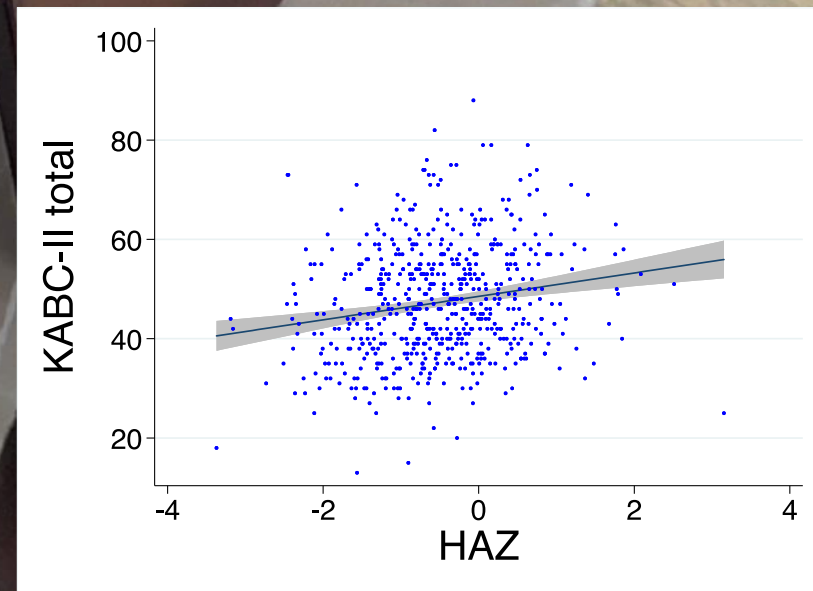
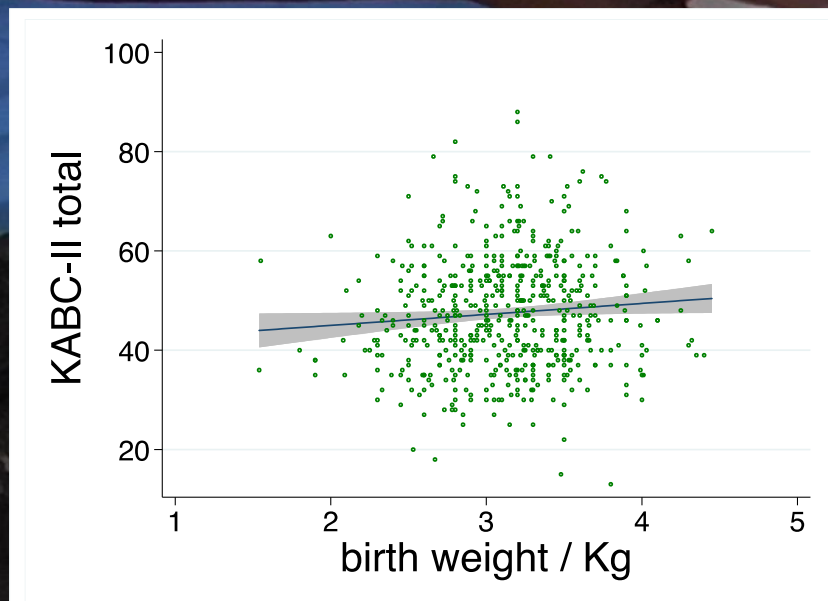
Field-based fitness assessment in young people: the ALPHA health-related fitness test battery for children and adolescents. Ruiz et al. Br J Sports Med, 45, 518-24 (2011)

Preliminary data: please do not share

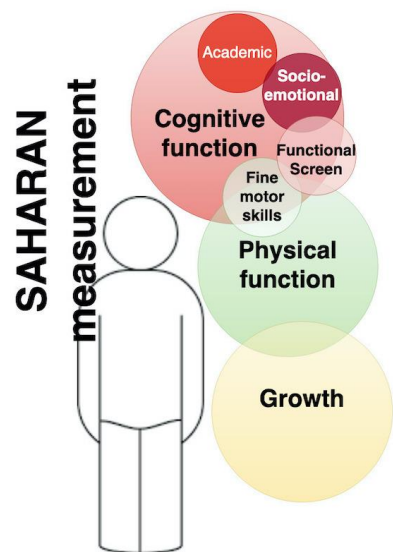
4.3 Cognitive function



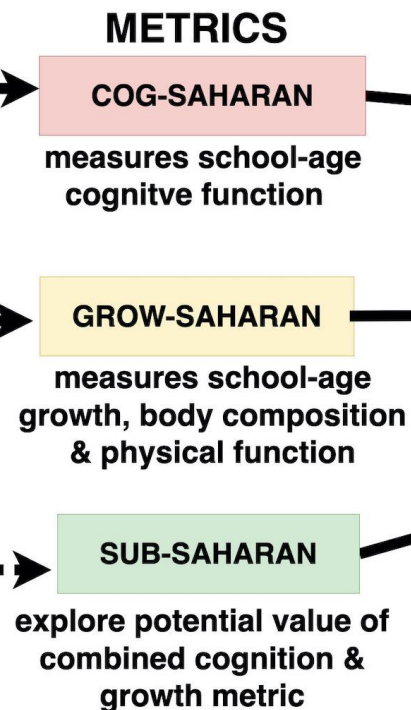
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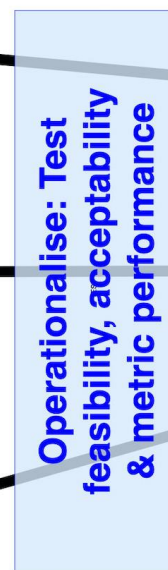
Aim 1: Develop the SAHARAN toolbox which holistically measures child growth & function



Aim 2: Develop the COG-SAHARAN & GROW-SAHARAN metrics



Aim 3: Operationalise metrics by analysing response to nutrition interventions in SHINE children

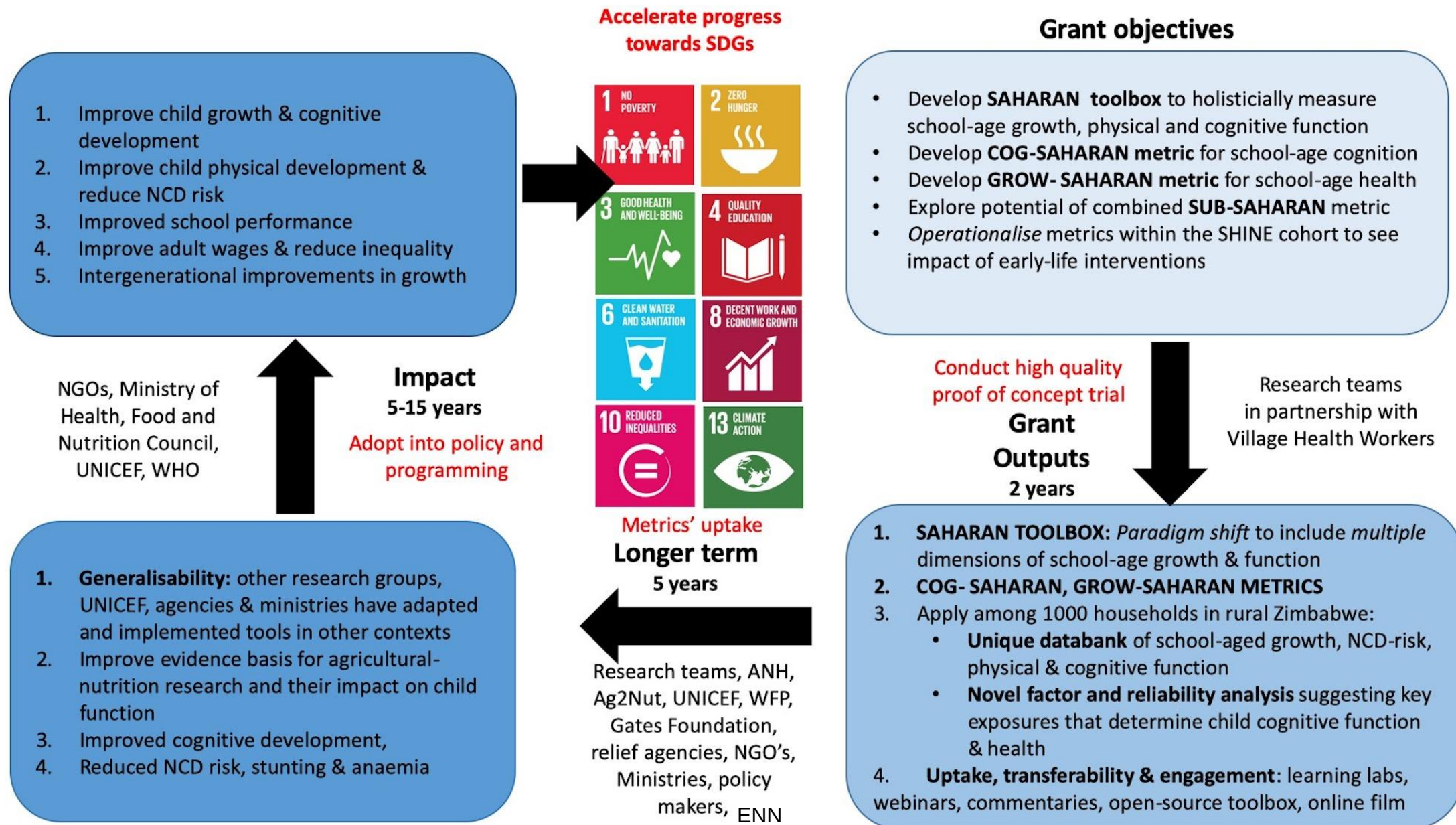


1000 school-aged children in rural Zimbabwe



UPTAKE





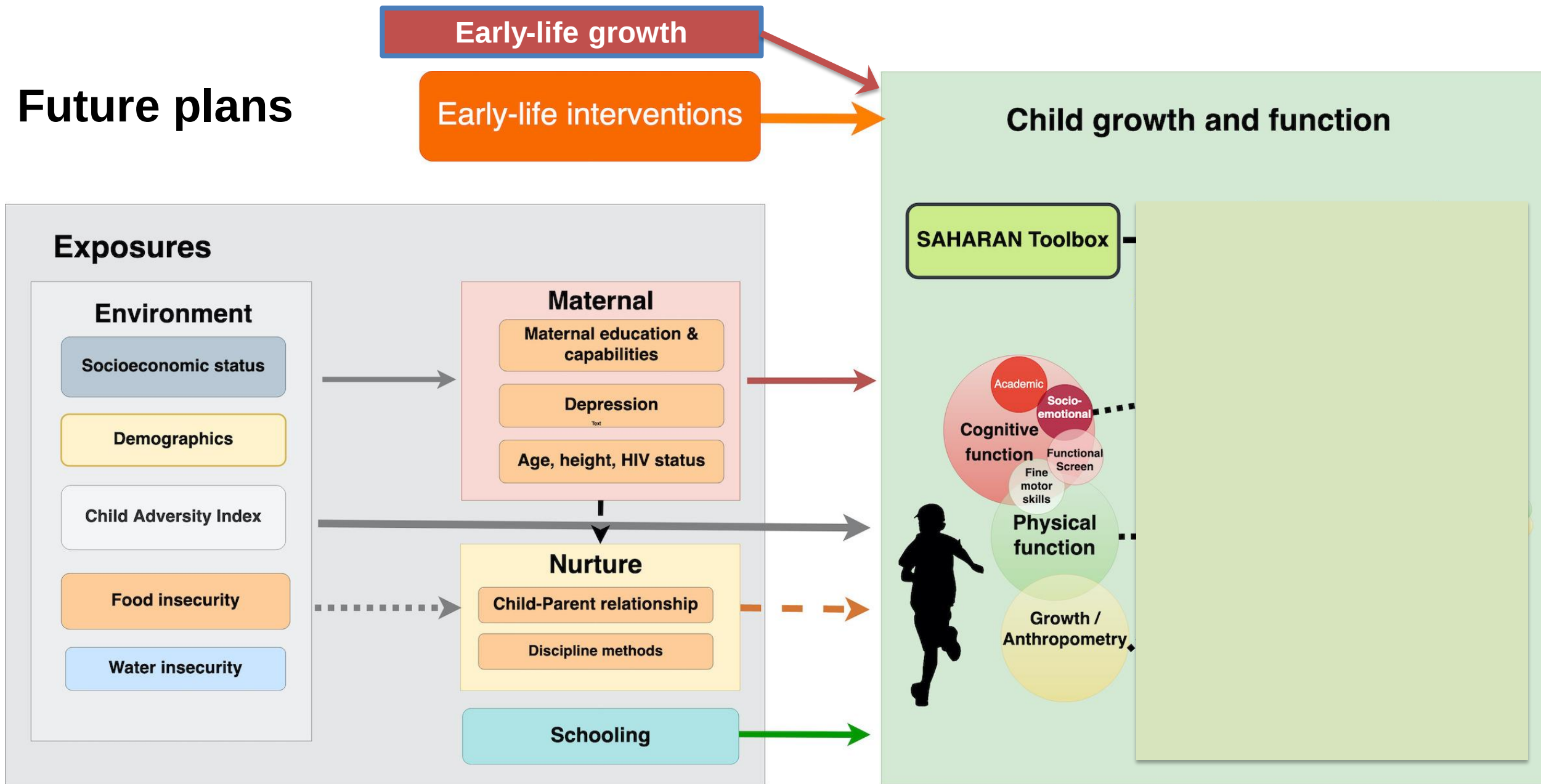
Summary

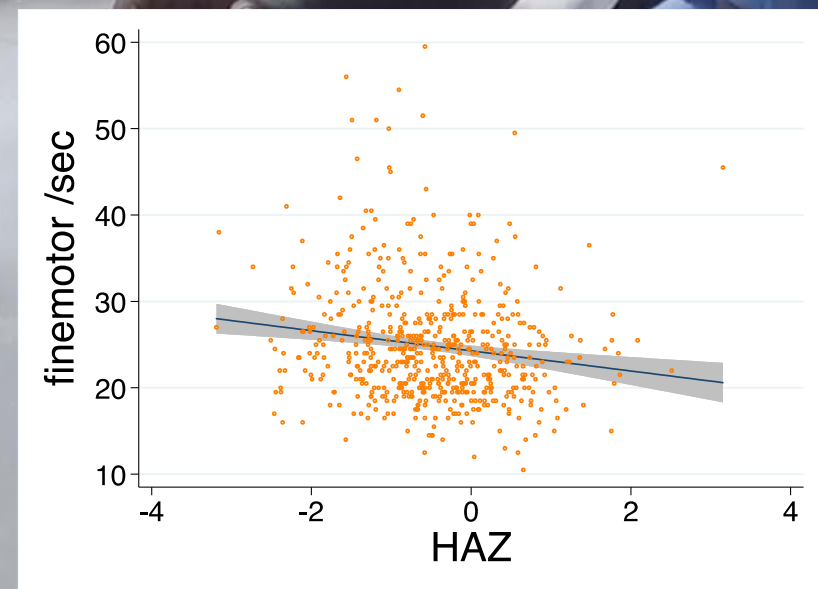
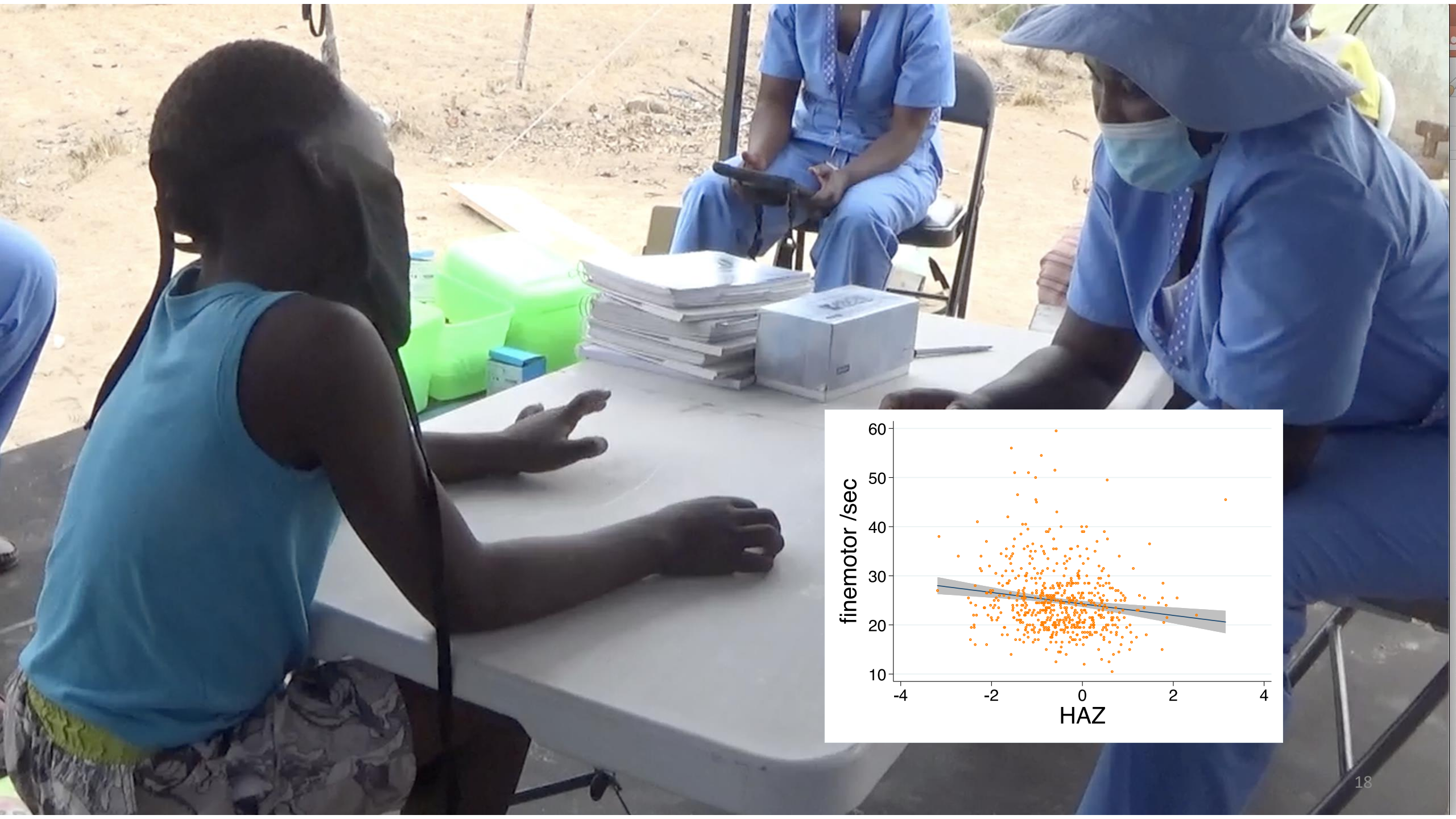
- **SAHARAN Toolbox**
- Body composition, growth and physical function:
- Strong link of function to growth
 - LMI, birthweight, LAZ at 18 months for physical function
 - HAZ for physical & cognitive function
- **Future**
- **Field-ready Metrics**
- Impact of SHINE nutrition & WASH interventions
- Early-life associations e.g. HIV-exposure
- Contemporary associations & adversity

Acknowledgements

- **Zvitambo field team:** Clever Mazhanga, Eunice Munyama, Gloria Mapako, Idah Mapurisa, Tsitsi Mashedze, Kundai Sibanda, Maria Kuona, Dzidzai Matemvi, Thomizodwa Mashiri, Dzie Chidhanguro, Peter Maparango, Kundai Sibanda, Dzidzai, Maria Kuona, Thombizodwa
- **Zvitambo Harare office:** Stephen Moyo, Robert Ntozini, Bernard Chasekwa, Virginia Sauramba Eddington Mpofu, Lisa Langhaug, Batsi Mutasa, Naume Tavengwa, Laura Smith
- **Supervisor:** Andrew Prendergast
- **Previous PI:** Jean Humphrey
- **Body composition:** Jonathan Wells
- **Physical function:** Marko Kerac & Carlos Eternod-Grijalva
- **Cognitive function:** Melissa Gladstone, Fahmida Tofail, Tamsen Rochat, Alan & Nadeen Kaufmann, Jaya Chandna
- Funders: Wellcome, Thrasher, NIH, **IMMANA**
- Partners: DHE, PHE, Zimbabwean Ministry of Health and Child Care

Future plans

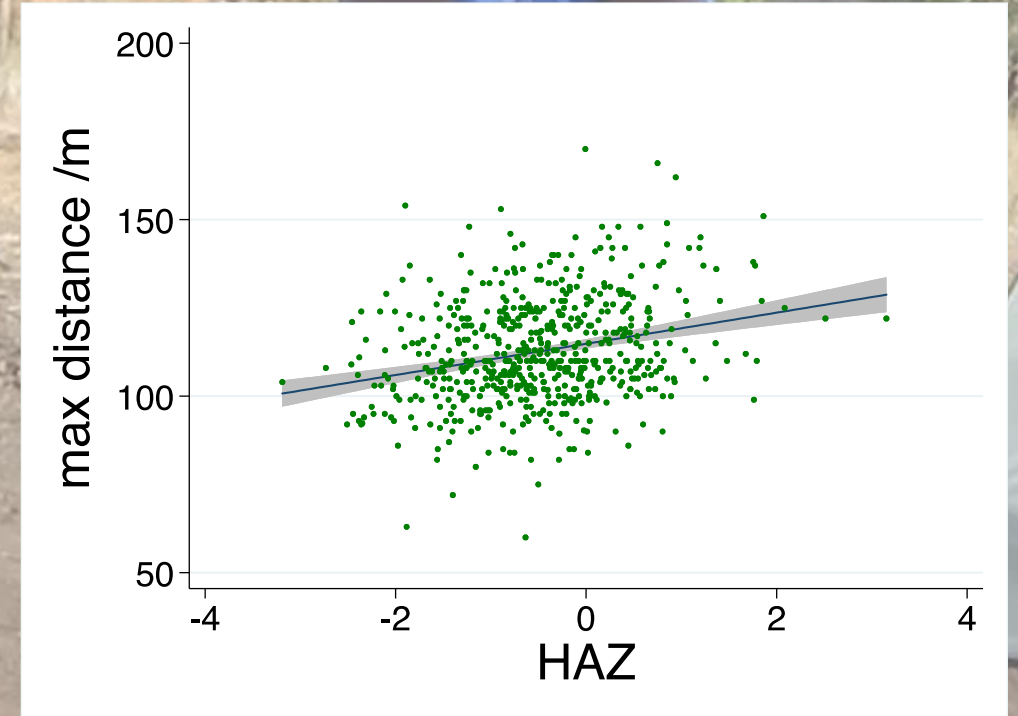




i) Broad jump

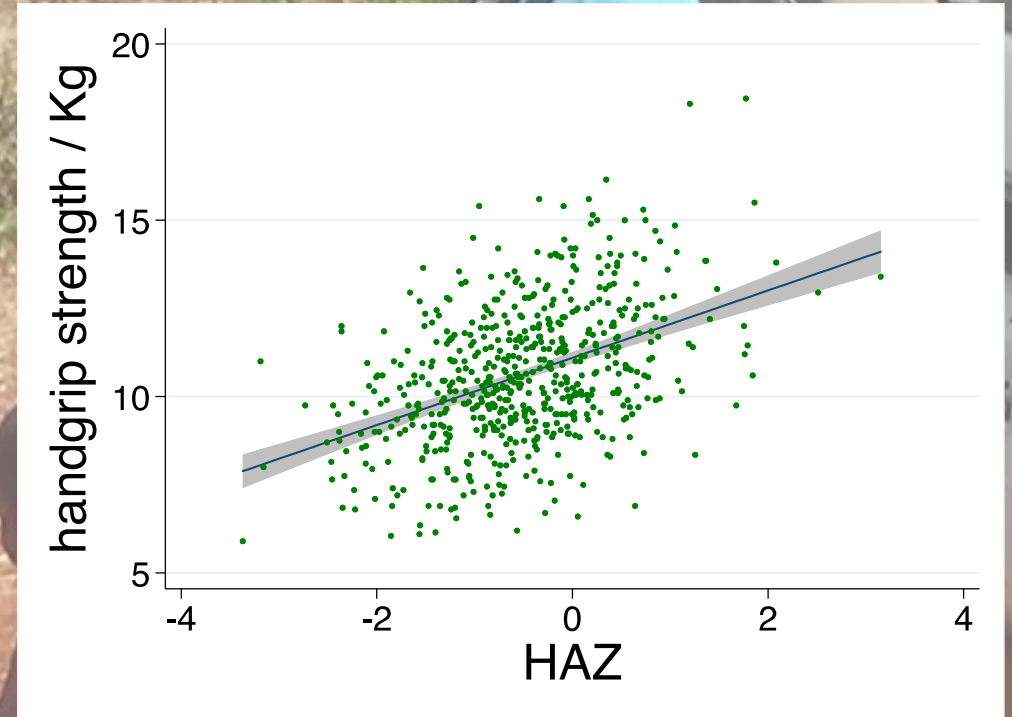
Physical function

Grip strength, broad jump
Beep test, Hb, BP, HR



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ii) Grip strength

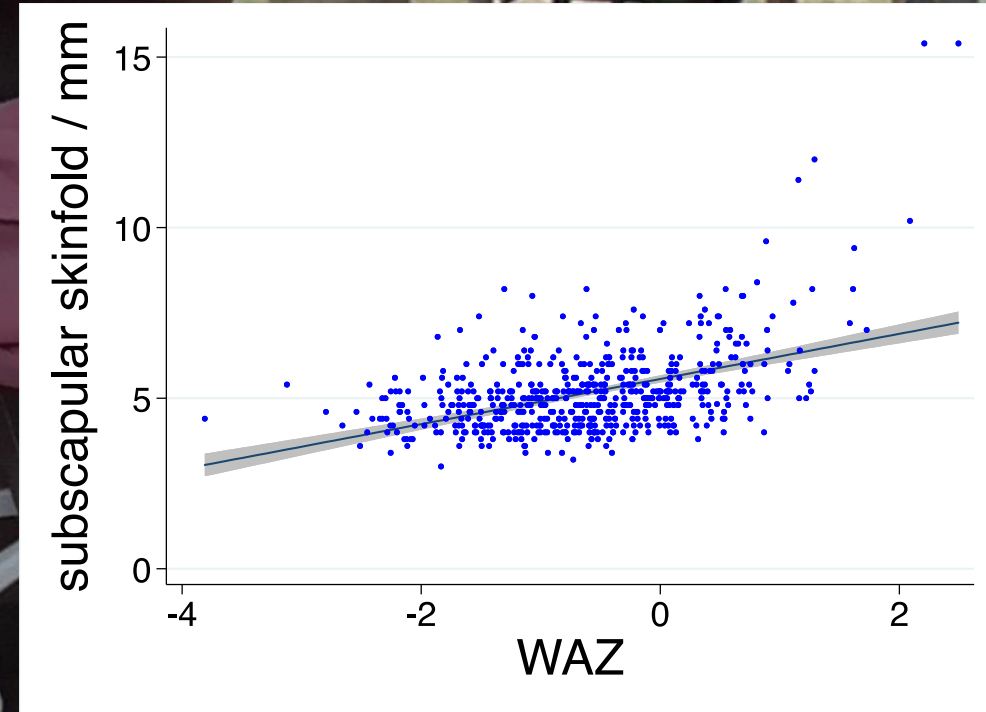
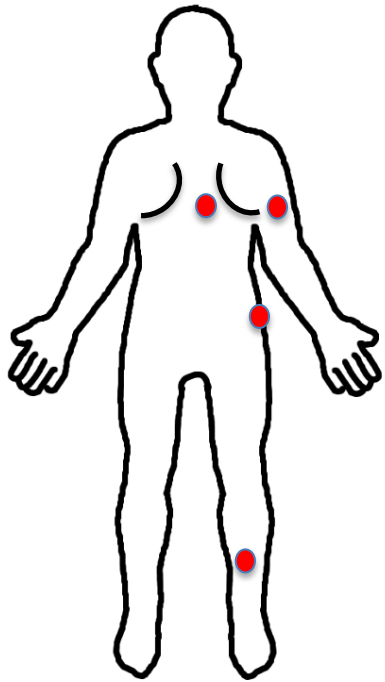


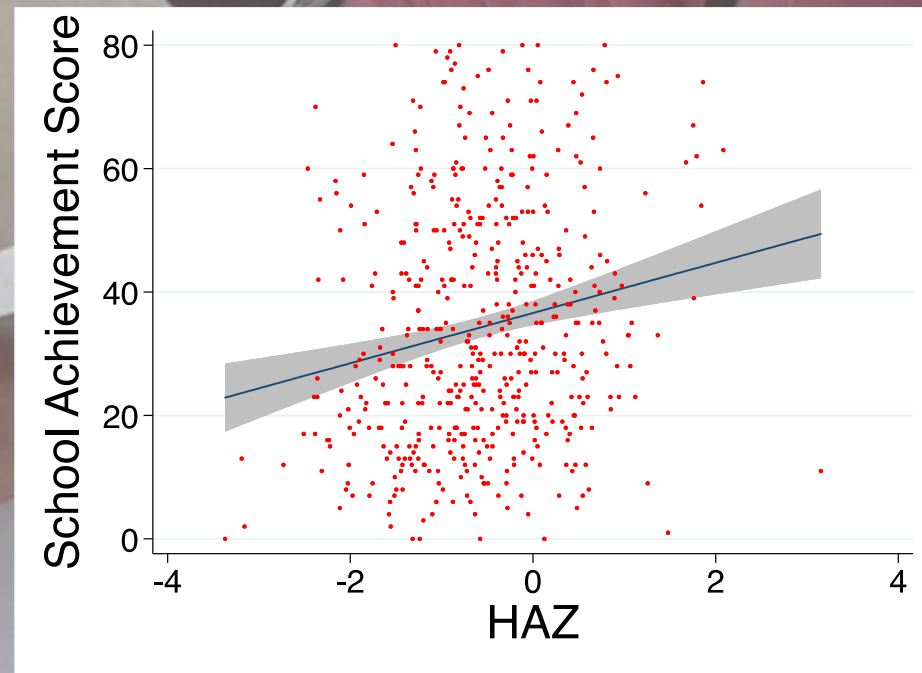
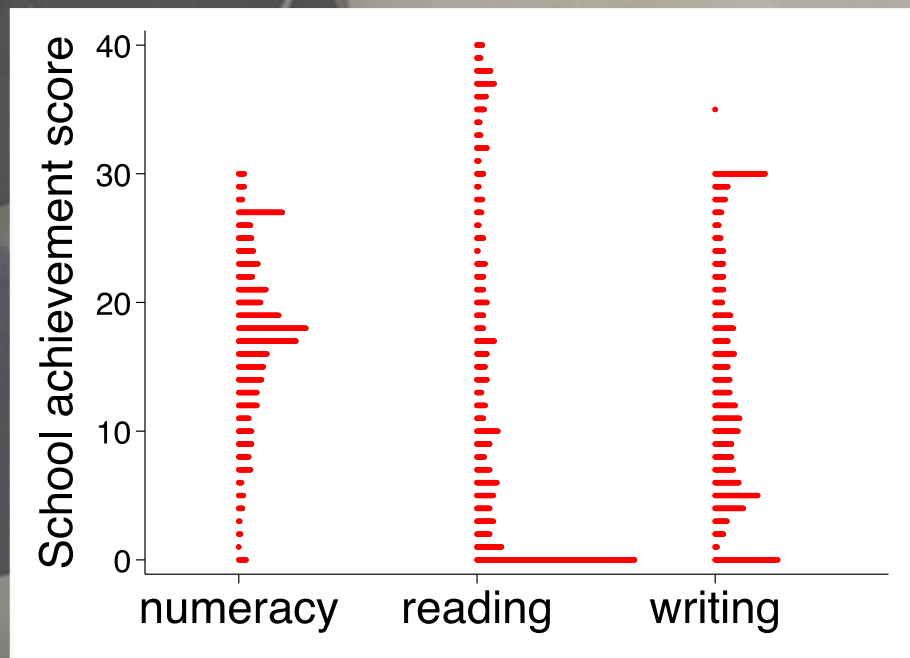
Hogrel, JY., Decostre, V., Alberti, C. *et al.* Stature is an essential predictor of muscle strength in children. *BMC Musculoskelet Disord* **13**, 176 (2012)

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Preliminary data; please do not share

Skinfold thickness: measures fat mass





Sigt effects: Schooling, child socioemotional score